

DOCKET NO.: BTG0008-100 (142769US01)

PATENT

In the Claims:

Please cancel claims 60-111 without prejudice to their presentation in another application and add new claims 112-163 as follows:

112. (new) A peptide comprising the amino acid sequence SEQ ID NO:1.
113. (new) The peptide of claim 112 wherein the peptide is 7 to 50 amino acids in length.
114. (new) The peptide of claim 112 comprising the amino acid sequence SEQ ID NO:2.
115. (new) The peptide of claim 114 wherein the peptide is 7 to 50 amino acids in length.
116. (new) A peptide comprising SEQ ID NO:1 and other gliadin or non-gliadin sequence.
117. (new) The peptide of claim 116 wherein the other gliadin sequence is from wheat, rye, barley, oats, or triticale.
118. (new) A peptide comprising SEQ ID NO:1 and a non-gliadin sequence.
119. (new) The peptide of claim 112, 116, or 118 which is a fusion protein.
120. (new) A peptide comprising:
 - a) a mutant gliadin protein comprising at least one mutation in the epitope ⁶²PQPQLPY⁶⁸, wherein the mutation decreases the ability of the epitope to induce a T cell response; or
 - b) a fragment of the mutant protein of a), wherein the fragment is at least 15 amino acids long and comprises the mutated PQPQLPY sequence.
121. (new) The peptide of claim 120 wherein the glutamine residue at position 65 is mutated.

DOCKET NO.: BTG0008-100 (142769US01)**PATENT**

122. (new) The peptide of claim 121 wherein the glutamine residue at position 65 is substituted by a histidine, tyrosine, tryptophan, lysine, proline, or arginine residue.

123. (new) An analogue of a peptide comprising the amino acid sequence SEQ ID NO:1, wherein the analogue is capable of being recognised by a T cell receptor that recognises the peptide, wherein the analogue is not more than 50 amino acids in length.

124. (new) A polynucleotide comprising a coding sequence that encodes a peptide of claim 112, 116, 118, or 120.

125. (new) The polynucleotide of claim 124 further comprising one or more regulatory sequences operably linked to the coding sequence, wherein the one or more regulatory sequences are capable of securing the expression of the coding sequence in a cell.

126. (new) The polynucleotide of claim 125 wherein the one or more regulatory sequences allow expression of the coding sequence in a prokaryotic or mammalian cell.

127. (new) The polynucleotide of claim 124 which is a vector or which is in the form of a vector.

128. (new) A product comprising two or more of:

a peptide comprising the amino acid sequence SEQ ID NO:1, or a fusion protein thereof;

a peptide 7 to 50 amino acids in length comprising the amino acid sequence SEQ ID NO:1, or a fusion protein thereof;

a peptide comprising the amino acid sequence SEQ ID NO:2, or a fusion protein thereof;

a peptide 7 to 50 amino acids in length comprising the amino acid sequence SEQ ID NO:2, or a fusion protein thereof;

DOCKET NO.: BTG0008-100 (142769US01)

PATENT

a peptide comprising SEQ ID NO:1 and other gliadin or non-gliadin sequence, or a fusion protein thereof;

a peptide comprising SEQ ID NO:1 and other gliadin or non-gliadin sequence, wherein the other gliadin sequence is from wheat, rye, barley, oats, or triticale, or a fusion protein thereof;

a peptide comprising SEQ ID NO:1 and a non-gliadin sequence, or a fusion protein thereof; and

an analogue of a peptide comprising the amino acid sequence SEQ ID NO:1 which is capable of being recognised by a T cell receptor that recognises a peptide comprising the amino acid sequence SEQ ID NO:1, wherein the peptide analogue is not more than 50 amino acids in length.

129. (new) A composition comprising a peptide, an analogue, or a composition, and a pharmaceutically acceptable carrier or diluent, wherein the peptide is:

a peptide comprising the amino acid sequence SEQ ID NO:1, or a fusion protein thereof;

a peptide 7 to 50 amino acids in length comprising the amino acid sequence SEQ ID NO:1, or a fusion protein thereof;

a peptide comprising the amino acid sequence SEQ ID NO:2, or a fusion protein thereof;

a peptide 7 to 50 amino acids in length comprising the amino acid sequence SEQ ID NO:2, or a fusion protein thereof;

a peptide comprising SEQ ID NO:1 and other gliadin or non-gliadin sequence, or a fusion protein thereof;

a peptide comprising SEQ ID NO:1 and other gliadin or non-gliadin sequence, wherein the other gliadin sequence is from wheat, rye, barley, oats, or triticale, or a fusion protein thereof;
or

a peptide comprising SEQ ID NO:1 and a non-gliadin sequence, or a fusion protein thereof;

DOCKET NO.: BTG0008-100 (142769US01)**PATENT**

wherein the analogue is an analogue of a peptide comprising the amino acid sequence SEQ ID NO:1 which is capable of being recognised by a T cell receptor that recognises a peptide comprising the amino acid sequence SEQ ID NO:1, wherein the peptide analogue is not more than 50 amino acids in length; and

wherein the product is two or more of the foregoing peptides or analogues.

130. (new) The composition of claim 129 comprising at least one peptide comprising the amino acid sequence SEQ ID NO:1 and a gliadin epitope from wheat, rye, barley, oats, or triticale.

131. (new) The composition of claim 130 comprising a gliadin epitope from each of wheat, rye, barley, oats, and triticale.

132. (new) A cell comprising a polynucleotide of claim 124 which has been transformed with such a polynucleotide.

133. (new) The cell of claim 132 which is a prokaryotic cell or a mammalian cell.

134. (new) The cell of claim 132 which is a cell of a graminaceous monocotyledonous species.

135. (new) The cell of claim 134 which is a cell of wheat, maize, oats, rye, rice, barley, triticale, sorghum, or sugar cane.

136. (new) A kit comprising a peptide of claim 112, 116, 118, or 120, and a means to detect the recognition of the peptide by a T cell.

137. (new) The kit of claim 136 wherein the means to detect recognition comprises an antibody to IFN- γ .

DOCKET NO.: BTG0008-100 (142769US01)**PATENT**

138. (new) The kit of claim 137 wherein the antibody is immobilised on a solid support and, optionally, comprises a means to detect the antibody-IFN- γ complex.

139. (new) A transgenic plant or plant seed comprising a plant cell of claim 124.

140. (new) A transgenic plant cell callus comprising a plant cell of claim 134.

141. (new) A food that comprises a protein of claim 120.

142. (new) The food of claim 141 wherein a peptide comprising a) a mutant gliadin protein comprising at least one mutation in the epitope ⁶²PQPQLPY⁶⁸, wherein the mutation decreases the ability of the epitope to induce a T cell response, or b) a fragment of the mutant protein of a), wherein the fragment is at least 15 amino acids long and comprises the mutated PQPQLPY sequence, is used instead of wild-type gliadin.

143. (new) A method of diagnosing coeliac disease or susceptibility to coeliac disease in an animal comprising:

a) contacting a sample from the animal with a peptide of claim 112, 116, 118, or 120;
and

b) determining *in vitro* whether a T cell in the sample recognises the peptide, wherein recognition by the T cell indicates that the animal has or is susceptible to coeliac disease.

144. (new) The method of claim 143 wherein a) comprises administering the peptide to the skin of the animal, and b) comprises detecting the presence of inflammation at the site of administration, wherein detection of inflammation indicates that the T cell of the animal recognises the peptide.

145. (new) The method of claim 143 wherein the sample is a blood sample.

DOCKET NO.: BTG0008-100 (142769US01)**PATENT**

146. (new) The method of 143 wherein the T cell is not re-stimulated in an antigen specific manner *in vitro* before determining *in vitro* whether the T cell in the sample recognises the peptide.

147. (new) The method of claim 143 wherein the recognition of the peptide by the T cell is determined by detecting the secretion of a cytokine from the T cell.

148. (new) The method of claim 147 wherein the cytokine is IFN- γ .

149. (new) The method of claim 147 wherein the cytokine is detected by allowing the cytokine to bind to an immobilised antibody specific to the cytokine and then detecting the presence of the antibody-cytokine complex.

150. (new) The method of claim 143 wherein b) comprises measuring whether the peptide binds a T cell receptor.

151. (new) A method of diagnosing coeliac disease or susceptibility to coeliac disease in an animal comprising detecting the presence of an antibody that binds to a peptide comprising SEQ ID NO:1 in a sample from the animal, wherein the presence of the antibody indicates that the individual has or is susceptible to coeliac disease.

152. (new) A method of determining whether a composition is capable of causing coeliac disease comprising detecting the presence of a peptide capable of being modified by a transglutaminase to produce a peptide comprising SEQ ID NO:1 in the composition, wherein the presence of the peptide indicates that the composition is capable of causing coeliac disease.

153. (new) The method of claim 152 wherein the detecting comprises contacting the composition with an antibody specific for the peptide which is capable of being modified by a

DOCKET NO.: BTG0008-100 (142769US01)

PATENT

transglutaminase, wherein binding of the antibody to a peptide in the composition indicates that the composition is capable of causing coeliac disease.

154. (new) A method of preparing an antibody specific to a peptide of claim 112, 116, 118, or 120 comprising administering the peptide to an animal and isolating the antibody from the animal.

155. (new) A method of preparing a peptide encoded by a polynucleotide of claim 120 comprising:

a) cultivating a cell comprising a polynucleotide of claim 120 under conditions that allow the expression of the peptide; and, optionally,

b) recovering the expressed protein.

156. (new) A method of obtaining a transgenic plant cell comprising transforming a plant cell with a vector of claim 127.

157. (new) A method of obtaining a crop product comprising harvesting a crop product from a plant of claim 139 or 140.

158. (new) The method of claim 157 further comprising processing the harvested product.

159. (new) The method of claim 157 wherein the plant is a wheat plant and the harvested crop product is grain.

160. (new) The method of claim 159 wherein the harvested product is further processed into flour or another grain product.

161. (new) A transgenic plant cell obtainable by the method of claim 156.

DOCKET NO.: BTG0008-100 (142769US01)

PATENT

162. (new) A method of treating or preventing coeliac disease comprising administering to an animal the peptide of claims 112, 116, 118, or 120, an analogue of claim 123, a product of claim 128, a composition of claim 129, or an analogue that binds to an epitope of a peptide of claim 112.

163. (new) The method of claim 162 wherein the treatment or prevention of coeliac disease is by tolerisation.